

**CLAIMS**

1 A light guiding device used for exposure of peripheral parts of a semiconductor wafer, comprising:

5 an optical fiber bundle, formed by bundling together a plurality of optical fibers and having a first light incidence end face and a first light emitting end face;

10 a glass rod, having a second light incidence end face and a second light emitting end face and making uniform the cross section of light emitting from said second light emitting end face by taking in, at said second light incidence end face, the light having emitted from said first light emitting end face of the optical fiber bundle and guiding this light to said 15 second light emitting end face; and

20 a glass rod holding member, which fixes said glass rod to a light emitting end face side front end part of said optical fiber bundle so that said second light incidence end face of the glass rod faces said first light emitting end face of the optical fiber bundle,

said second light emitting end face of the glass rod having a rectangular shape.

25 2. The light guiding device according to Claim 1, wherein said glass rod satisfies the relationships expressed by the following formulae (1) and (2):

$$L > \frac{d}{2 \tan \theta} \dots (1)$$

$$n \sin \theta = n' \sin \theta' \dots (2)$$

where:

L [mm] : length of said glass rod

5 d [mm] : length of the diagonal of said second  
light emitting end face of the glass rod

n : refractive index of air

n' : refractive index of said glass rod

10 θ : maximum emit angle from said optical fiber  
into air

θ' : angle of refraction of light, which has  
emitted from said optical fiber at the maximum emit  
angle, upon incidence onto said second light incidence  
end face.

15 3. The light guiding device according to Claim  
1 or 2, comprising a sleeve member, which covers the  
light emitting end face side front end part of said  
optical fiber bundle, and wherein said glass rod  
holding member is detachably mounted to said sleeve  
member.

20 4. The light guiding device according to any  
of Claims 1 to 3, wherein

25 said plurality of optical fibers adheres to each  
other by an adhesive agent at the light emitting end  
face side front end part of said optical fiber bundle.

5. The light guiding device according to any of Claims 1 to 4, wherein

5 said first light emitting end face of the said optical fiber bundle faces said second light incidence end face of the glass rod via a gap.

6. The light guiding device according to any of Claims 1 to 5, comprising:

10 a sleeve member, covering the light emitting end face side front end part of said optical fiber bundle; and

15 a curving part holding member, which, by being fixed to a portion of said optical fiber bundle in the vicinity of the light emitting end face side front end part and to said sleeve member, maintains a state wherein said optical fiber bundle is curved in the vicinity of said front end part.